AMENDMENTS TO THE DRAWINGS:

The attached sheet of drawings includes changes to Fig. 1. This sheet, which includes Fig. 1, replaces the original sheet including Fig. 1. Fig. 1 has been amended to remove a line (or lines) connecting the gas cavity (108), the substrate layer (105) and the MEMS structure (110). Applicants respectfully submit that no new matter is added or included in the present amended Fig. 1.

Attachment: Replacement Sheet
Annotated Sheet Showing Changes

REMARKS

Claims 1-51 are present in the case upon entry of this amendment. Claim 1 has been amended, Claim 51 has been added, and no Claims have been cancelled herein.

The basis for added Claim 51 is provided by Claim 1 as originally filed

The basis for the amendment to Claim 1 regarding the protective structure being positioned on a portion of the substrate layer is provided by the specification as a whole, and within original Claim 1. For example, original Claim 1 recites the protective structure as being "formed on the substrate layer". As such, the protective structure is positioned on a portion of the substrate layer. More particularly, and with reference for example to Figure 1 and paragraphs [0025] through [0027] on page 4 of the specification, barrier layer 120 is described and depicted as being positioned on substrate layer 105.

The basis for the amendment to Claim 1 with regard to the protective structure being a distinct structure from the substrate is provided by the specification as a whole. More particularly, and with reference, for example, to Figure 1 and paragraphs [0025] through [0027] on page 4 of the specification, barrier layer 120 is described and depicted as being a distinct structure relative to substrate layer 105.

Objection to the Drawings

The drawings stand objected to because Figure 1 shows two gas cavities, one above the substrate layer and one below the substrate layer. In accordance with the Examiner's suggestion, Figure 1 has been amended herein to remove a line (or lines) connecting the gas cavity (108), the substrate layer (105), and the MEMS structure (110). A replacement sheet, including amended Figure 1, is included in the Addendum herewith. Applicants respectfully submit that no new matter is added or included in the present amended Figure 1.

In light of the amended Figure 1 included herewith, the present objection to the drawings is deemed to have been fully addressed and overcome. Reconsideration and withdrawal of the present objection to the drawings is respectfully requested.

Objection to the Specification

The specification stands objected to with regard to certain improperly recited characters. Paragraph [0028] has been replaced herein, and the recitation of "barrier layer 20" in

the last sentence thereof has been replaced with --barrier layer 120--, in accordance with the Examiner's suggestion. Paragraph [0052] has been replaced herein, and the recitation of "air cavity 616" in the next to last sentence thereof has been replaced with --air cavity 612-- in accordance with the Examiner's suggestion. Paragraph [0053] has been replaced herein, and the recitation of "sacrificial material 105" in the first sentence thereof has been replaced with --sacrificial material 325-- in accordance with the Examiner's suggestion.

In light of the replacement paragraphs provided herein, the objections to the specification are deemed to have been fully addressed and overcome. Reconsideration and withdrawal of the present objection to the specification is respectfully requested.

Claim Rejections

Claims 1-5 and 13 stand rejected under 35 U.S.C. §102(b) as being anticipated by United States Patent No. 6,803,637 B2 (**Benzel et al.**). This rejection is respectfully traversed in light of the amendments herein and the following remarks.

Benzel et al. disclose a micromechanical component that includes: a substrate (e.g., a silicon wafer substrate 10 having p-doped and n-doped zones); a cavity (e.g., 50) that is formed within the substrate by etching; structures (e.g., permanent structures 70 and exposed structures 60) that are formed within the cavity by etching; and a porous silicon zone (e.g., 30) that is formed from the substrate material, during etching, and which defines the upper limit of the cavity that resides within the substrate. See, for example, the abstract, Figures 1a through 1c, and column 4, line 62 through column 5, line 13 of Benzel et al.

Benzel et al. describe forming the n-doped zones within the p-doped wafer substrate by an implantation method. During the etching process (e.g., with hydrofluoric acid), the porous layer (e.g., 30) is formed from and within the p-doped material of the substrate, and the underlying p-doped zones are removed through the porous layer. The n-doped zones are not readily etched away during the etching process. As such, as the p-doped zones are removed, the n-doped zones remain/are formed within the resulting cavity. See column 4, lines 16-40 of Benzel et al.

The micro electro-mechanical device packaging system of Applicants' present claims includes a micro electro-mechanical device that **is formed on** a substrate layer. In

addition, the micro electro-mechanical device of Applicants' present claims includes a protective structure that is **positioned on** a portion of the substrate layer, and which **is a distinct structure** relative to the substrate layer. Accordingly, the gas cavity which encloses an active surface of the micro electro-mechanical device of Applicants' present claims necessarily resides on (i.e., above) the substrate layer.

Benzel et al. provide no disclosure, teaching, or suggestion with regard to a micro electro-mechanical device in which the micro electro-mechanical device is formed on the substrate layer. The micro electro-mechanical structures of Benzel et al.'s device are necessarily formed and reside within the substrate.

Benzel et al. provide no disclosure, teaching or suggestion with regard to a micro electro-mechanical device in which the gas cavity that encloses an active surface of the micro electro-mechanical device that resides on (or above) the substrate. The cavity of the micromechanical component of Benzel et al. is formed and necessarily resides within the substrate.

Benzel et al. provide no disclosure, teaching, or suggestion with regard to a protective structure that is positioned on a portion of the substrate layer, and which is a distinctive structure relative to the substrate layer. The porous layer of Benzel et al.'s micromechanical component is necessarily positioned within the substrate and is formed from the substrate material, and as such is necessarily part of the substrate. As such, the porous layer of Benzel et al.'s micromechanical component is not (as it can not be) a distinct structure relative to the substrate layer.

In light of the amendments herein and the preceding remarks, Applicants' claims are deemed to be unanticipated by and patentable over Benzel et al. Reconsideration and withdrawal of the present rejection is respectfully requested.

Claims 6-9 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Benzel et al. in view of U.S. Patent No. 6,936,494 B2 (**Cheung**). This rejection is respectfully traversed with regard to the amendments herein and the following remarks.

Benzel et al. has been discussed previously herein and disclose a micromechanical component that includes: a substrate (e.g., a silicon wafer substrate 10 having p-doped and n-

doped zones); a cavity (e.g., 50) that is formed within the substrate by etching; structures (e.g., permanent structures 70 and exposed structures 60) that are formed within the cavity by etching; and a porous silicon zone (e.g., 30) that is formed from the substrate material during etching, and which defines the upper limit of the cavity that resides within the substrate.

Benzel et al. describe forming the n-doped zones within the p-doped wafer substrate by an implantation method. During the etching process (e.g., with hydrofluoric acid), the porous layer (e.g., 30) is formed from and within the p-doped material of the substrate, and the underlying p-doped zones are removed through the porous layer. The n-doped zones are not readily etched away during the etching process. As such, as the p-doped zones are removed, the n-doped zones remain/are formed within the resulting cavity.

Cheung discloses a method of hermetically packaging a microscopic structure including a microelectromechanical system (MEMS) device. The method disclosed by Cheung necessarily includes: depositing a capping layer of sacrificial material (e.g., 34) over a microscopic structure (e.g., 24) residing on a substrate (e.g., 26); depositing a support layer (e.g., 38) over the capping layer; forming at least one hole (e.g., 40) through the support layer; removing the capping layer through the holes by etching; depositing a sealing material (e.g., 46) over the support layer; and locally heating the sealing material so as to melt the sealing material and hermetically seal the holes (e.g., 40). See the abstract; Figures 1-4; Figure 1A; Figures 8 and 9; column 3, lines 15-40; column 5, line 66 through column 6, line 6; column 6, line 53 through column 7, line 42; and column 8, line 44 through column 9, line 11 of Cheung.

Neither Benzel et al. nor Cheung provide the requisite disclosure that would motivate a skilled artisan to combine or otherwise modify their disclosures in an attempt to somehow arrive at Applicants' presently claimed micro electro-mechanical device packaging system. In particular, Benzel et al. disclose a micromechanical component that includes: a substrate; a cavity that is formed within the substrate by etching; structures that are formed within the cavity by etching; and a porous silicon zone that is formed from the substrate material during etching, and which defines the upper limit of the cavity that resides within the substrate. The hermitically packaged MEMS device of Cheung includes a microscopic structure (e.g., 24) that resides on a substrate. Benzel et al. provide no disclosure, teaching, or suggestion with

regard to forming a microscopic structure on a substrate. Cheung provides no disclosure, teaching, or suggestion with regard to forming a cavity and microscopic structures within the substrate, or a porous layer from the substrate material that defines the upper limit of an underlying cavity.

In addition, even if the disclosures of Benzel et al. and Cheung were combined, such a combination would result in an inoperable process, and as such would not result in the micro electro-mechanical device packaging system of Applicants' present claims. In particular, the process of Cheung necessarily involves depositing a capping layer of sacrificial material (e.g., 34) over a microscopic structure (e.g., 24) residing on a substrate (e.g., 26). The process by which Benzel et al. forms their micromechanical component, necessarily involves removing substrate material through a porous layer of the substrate. As such, neither Benzel et al. nor Cheung provide disclosure regarding a reasonable way in which the capping layer of sacrificial material of Cheung could somehow be deposited or otherwise introduced through the porous layer and into the cavity of Benzel et al. In addition, neither Benzel et al. nor Cheung provide disclosure that would encourage or motivate a skilled artisan to somehow attempt to deposit or introduce the capping layer of sacrificial material of Cheung through the porous layer and into the cavity of Benzel et al.

If proposed modifications render a reference inoperable for its intended purpose, then there is no suggestion or motivation to make the proposed modification, and accordingly the proposed modification would not be obvious. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984). Similarly, according to the MPEP, the claimed combination of references used to ground an obviousness rejection may not change the principle of operation of the primary reference or render the reference inoperable for its intended purpose. 2145(III); 2143.01.

Rejections based on "obviousness cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *KSR International Co. v. Teleflex Inc.*, 550 U.S. 398, 82 USPQ2d 1385, 1395 (2007). In addition, "a rationale to support a conclusion that a claim would have been obvious is that all the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change

in their respective functions, and the combination would have yielded nothing more than predictable results to one of ordinary skill in the art." *KSR International Co. v. Teleflex Inc.*, 550 U.S. 398, 82 USPQ2d 1385, 1395 (2007).

In light of the amendments herein and the preceding remarks, Applicants' claims are deemed to be unobvious and patentable over Benzel et al. in view of Cheung Reconsideration and withdrawal of the present rejection is respectfully requested.

Claims 10-12, 15-20, 24-28, and 30-32 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Benzel et al. in view of U.S. Patent Application Publication No. 2006/0014374 A1 (**Barth et al.**). This rejection is respectfully traversed in light of the amendments herein and the following remarks.

Benzel et al. has been discussed previously herein and disclose a micromechanical component that includes: a substrate (e.g., a silicon wafer substrate 10 having p-doped and n-doped zones); a cavity (e.g., 50) that is formed within the substrate by etching; structures (e.g., permanent structures 70 and exposed structures 60) that are formed within the cavity by etching; and a porous silicon zone (e.g., 30) that is formed from the substrate material during etching, and which defines the upper limit of the cavity that resides within the substrate.

Benzel et al. describe forming the n-doped zones within the p-doped wafer substrate by an implantation method. During the etching process (e.g., with hydrofluoric acid), the porous layer (e.g., 30) is formed from and within the p-doped material of the substrate, and the underlying p-doped zones are removed through the porous layer. The n-doped zones are not readily etched away during the etching process. As such, as the p-doped zones are removed, the n-doped zones remain/are formed within the resulting cavity.

Barth et al. disclose a layer arrangement and a process of forming the layer arrangement that involves sequentially applying or forming a layered structure having decomposable structures (e.g., 112) between upper (e.g., 124) and lower (e.g., 104) layers, and thermally decomposing the decomposable structures to from cavities (e.g., 128) residing between the upper and lower layers. The lower layer (e.g., 104), and accordingly the whole layered structure, is formed over or on a silicon wafer (e.g., 100). See the abstract, Figures 1E, 1F, 1G, and paragraphs [0056] through [0062] of Barth et al. Barth et al. provide no disclosure, teaching,

or suggestion with regard to encapsulating a microstructure, such as a MEMS device, in a decomposable structure (e.g., 112).

Neither Benzel et al. nor Barth et al. provide the requisite disclosure that would motivate a skilled artisan to combine or otherwise modify their disclosures in an attempt to somehow arrive at Applicants' presently claimed micro electro-mechanical device packaging system, or method of producing the micro electro-mechanical device packaging system. In particular, Benzel et al. disclose a micromechanical component that includes: a substrate; a cavity that is formed within the substrate by etching; structures that are formed within the cavity by etching; and a porous silicon zone that is formed from the substrate material during etching, and which defines the upper limit of the cavity that resides within the substrate. The layer arrangement of Barth et al. is formed on (i.e., over) an underlying silicon substrate. Benzel et al. provide no disclosure, teaching, or suggestion with regard to forming a microscopic structure or micromechanical component on a substrate. Barth et al. provide no disclosure, teaching, or suggestion with regard to forming a cavity and microscopic structures within the substrate, or a porous layer from the substrate material that defines the upper limit of an underlying cavity.

In addition, even if the disclosures of Benzel et al. and Barth et al. were combined, such a combination would result in an inoperable process, and as such would not result in the micro electro-mechanical device packaging system or method of Applicants' present claims. In particular, the process of Barth et al. necessarily involves forming a multilayer structure on top of a substrate. The process by which Benzel et al. forms their micromechanical component, necessarily involves removing substrate material through a porous layer of the substrate. As such, neither Benzel et al. nor Barth et al. provide disclosure regarding a reasonable way in which any of the layers of Barth et al., and in particular the decomposable structures (e.g., 112) of Barth et al., could somehow be deposited or otherwise introduced through the porous layer and into the cavity of Benzel et al. In addition, neither Benzel et al. nor Barth et al. provide disclosure that would encourage or motivate a skilled artisan to somehow attempt to deposit or introduce any of the layers of Barth et al., and in particular the decomposable structures (e.g., 112) of Barth et al., through the porous layer and into the cavity of Benzel et al.

If proposed modifications render a reference inoperable for its intended purpose, then there is no suggestion or motivation to make the proposed modification, and accordingly the proposed modification would not be obvious. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984). Similarly, according to the MPEP, the claimed combination of references used to ground an obviousness rejection may not change the principle of operation of the primary reference or render the reference inoperable for its intended purpose. 2145(III); 2143.01.

Rejections based on "obviousness cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *KSR International Co. v. Teleflex Inc.*, 550 U.S. 398, 82 USPQ2d 1385, 1395 (2007). In addition, "a rationale to support a conclusion that a claim would have been obvious is that all the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded nothing more than predictable results to one of ordinary skill in the art." *KSR International Co. v. Teleflex Inc.*, 550 U.S. 398, 82 USPQ2d 1385, 1395 (2007).

In light of the amendments herein and the preceding remarks, Applicants' claims are deemed to be unobvious and patentable over Benzel et al. in view of Barth et al. Reconsideration and withdrawal of the present rejection is respectfully requested.

Claims 29, 33-37, 40-42, and 46 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Benzel et al. in view of Barth et al., and further in view of Cheung. This rejection is respectfully traversed with regard to the following remarks.

Benzel et al. has been discussed previously herein and disclose a micromechanical component that includes: a substrate (e.g., a silicon wafer substrate 10 having p-doped and n-doped zones); a cavity (e.g., 50) that is formed within the substrate, by etching; structures (e.g., permanent structures 70 and exposed structures 60) that are formed within the cavity, by etching; and a porous silicon zone (e.g., 30) that is formed from the substrate material, during etching, and which defines the upper limit of the cavity that resides within the substrate.

Benzel et al. describe forming the n-doped zones within the p-doped wafer substrate by an implantation method. During the etching process (e.g., with hydrofluoric acid),

the porous layer (e.g., 30) is formed from and within the p-doped material of the substrate, and the underlying p-doped zones are removed through the porous layer. The n-doped zones are not readily etched away during the etching process. As such, as the p-doped zones are removed, the n-doped zones remain/are formed within the resulting cavity.

Barth et al. has been discussed previously herein, and disclose a layer arrangement and a process of forming the layer arrangement that involves sequentially applying or forming a layered structure with decomposable structures (e.g., 112) between upper (e.g., 124) and lower (e.g., 104) layers, and thermally decomposing the decomposable structures to from cavities (e.g., 128) residing between the upper and lower layers. The lower layer (e.g., 104), and accordingly the whole layered structure, is formed over or on a silicon wafer (e.g., 100). Barth et al. provide no disclosure, teaching or suggestion with regard to encapsulating a microstructure, such as a MEMS device, in a decomposable structure (e.g., 112).

Cheung has been discussed previously herein, and discloses a method of hermetically packaging a microscopic structure including a microelectromechanical system (MEMS) device. The method disclosed by Cheung necessarily involves: depositing a capping layer of sacrificial material (e.g., 34) over a microscopic structure (e.g., 24) residing on a substrate (e.g., 26); depositing a support layer (e.g., 38) over the capping layer; forming at least one hole (e.g., 40) through the support layer; removing the capping layer through the holes by etching; depositing a sealing material (e.g., 46) over the support layer; and locally heating the sealing material so as to melt the sealing material and hermetically seal the holes (e.g., 40).

Neither Benzel et al. nor Barth et al. provide the requisite disclosure that would motivate a skilled artisan to combine or otherwise modify their disclosures in an attempt to somehow arrive at Applicants' presently claimed micro electro-mechanical device packaging system, or method of producing the micro electro-mechanical device packaging system. In particular, Benzel et al. disclose a micromechanical component that includes: a substrate; a cavity that is formed within the substrate by etching; structures that are formed within the cavity by etching; and a porous silicon zone that is formed from the substrate material during etching, and which defines the upper limit of the cavity that resides within the substrate. The layer arrangement of Barth et al. is formed on (i.e., over) an underlying silicon substrate. Benzel et al.

provide no disclosure, teaching, or suggestion with regard to forming a microscopic structure or micromechanical component on a substrate. Barth et al. provide no disclosure, teaching, or suggestion with regard to forming a cavity and microscopic structures within the substrate, or a porous layer from the substrate material that defines the upper limit of an underlying cavity.

In addition, even if the disclosures of Benzel et al. and Barth et al. were combined, such a combination would result in an inoperable process, and as such would not result in the micro electro-mechanical device packaging system or method of Applicants' present claims. In particular, the process of Barth et al. necessarily involves forming a multilayer structure on top of a substrate. The process by which Benzel et al. forms their micromechanical component, necessarily involves removing substrate material through a porous layer of the substrate. As such, neither Benzel et al. nor Barth et al. provide disclosure regarding a reasonable way in which any of the layers of Barth et al., and in particular the decomposable structures (e.g., 112) of Barth et al., could somehow be deposited or otherwise introduced through the porous layer and into the cavity of Benzel et al. In addition, neither Benzel et al. nor Barth et al. provide disclosure that would encourage or motivate a skilled artisan to somehow attempt to deposit or introduce any of the layers of Barth et al., and in particular the decomposable structures (e.g., 112) of Barth et al., through the porous layer and into the cavity of Benzel et al.

Neither Benzel et al. nor Cheung provide the requisite disclosure that would motivate a skilled artisan to combine or otherwise modify their disclosures in an attempt to somehow arrive at Applicants' presently claimed micro electro-mechanical device packaging system, or method of producing the micro electro-mechanical device packaging system. In particular, Benzel et al. disclose a micromechanical component that includes: a substrate; a cavity that is formed within the substrate by etching; structures that are formed within the cavity by etching; and a porous silicon zone that is formed from the substrate material during etching, and which defines the upper limit of the cavity that resides within the substrate. The hermitically packaged MEMS device of Cheung includes a microscopic structure (e.g., 24) that resides on a substrate. Benzel et al. provide no disclosure, teaching, or suggestion with regard to forming a microscopic structure on a substrate. Cheung provides no disclosure, teaching, or suggestion with regard to forming a cavity and microscopic structures within the substrate, or a porous layer from the

substrate material that defines the upper limit of an underlying cavity.

In addition, even if the disclosures of Benzel et al. and Cheung were combined, such a combination would result in an inoperable process, and as such would not result in the micro electro-mechanical device packaging system or method of Applicants' present claims. In particular, the process of Cheung necessarily involves depositing a capping layer of sacrificial material (e.g., 34) over a microscopic structure (e.g., 24) residing on a substrate (e.g., 26). The process by which Benzel et al. forms their micromechanical component, necessarily involves removing substrate material through a porous layer of the substrate. As such, neither Benzel et al. nor Cheung provide disclosure regarding a reasonable way in which the capping layer of sacrificial material of Cheung could somehow be deposited or otherwise introduced through the porous layer and into the cavity of Benzel et al. In addition, neither Benzel et al. nor Cheung provide disclosure that would encourage or motivate a skilled artisan to somehow attempt to deposit or introduce the capping layer of sacrificial material of Cheung through the porous layer and into the cavity of Benzel et al.

Neither Barth et al. nor Cheung provide the requisite disclosure that would motivate a skilled artisan to combine or otherwise modify their disclosures in an attempt to somehow arrive at Applicants' presently claimed micro electro-mechanical device packaging system, or method of producing the micro electro-mechanical device packaging system. Barth et al. provide no disclosure, teaching, or suggestion with regard to applying a thermally decomposable structure over a microscopic structure, or removing the thermally decomposable structure by etching, or whether such would be feasible. Cheung provides no disclosure, teaching, or suggestion with regard to removing the etchable capping layer by means of thermal decomposition, or whether such would be feasible.

If proposed modifications render a reference inoperable for its intended purpose, then there is no suggestion or motivation to make the proposed modification, and accordingly the proposed modification would not be obvious. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984). Similarly, according to the MPEP, the claimed combination of references used to ground an obviousness rejection may not change the principle of operation of the primary reference or render the reference inoperable for its intended purpose. 2145(III); 2143.01.

Rejections based on "obviousness cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *KSR International Co. v. Teleflex Inc.*, 550 U.S. 398, 82 USPQ2d 1385, 1395 (2007). In addition, "a rationale to support a conclusion that a claim would have been obvious is that all the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded nothing more than predictable results to one of ordinary skill in the art." *KSR International Co. v. Teleflex Inc.*, 550 U.S. 398, 82 USPQ2d 1385, 1395 (2007).

In light of the preceding remarks, Applicants' claims are deemed to be unobvious and patentable over Benzel et al. in view of Barth et al., and further in view of Cheung. Reconsideration and withdrawal of the present rejection is respectfully requested.

Claim 14 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Benzel et al. in view of U.S. Patent No. 7,078,796 B2 (**Dunn et al.**). This rejection is respectfully traversed with regard to the amendments herein and the following remarks.

Benzel et al. has been discussed previously herein and disclose a micromechanical component that includes: a substrate (e.g., a silicon wafer substrate 10 having p-doped and n-doped zones); a cavity (e.g., 50) that is formed within the substrate by etching; structures (e.g., permanent structures 70 and exposed structures 60) that are formed within the cavity by etching; and a porous silicon zone (e.g., 30) that is formed from the substrate material during etching, and which defines the upper limit of the cavity that resides within the substrate. See, for example, the abstract, Figures 1a through 1c, and column 4, line 62 through column 5, line 13 of Benzel et al.

Benzel et al. describe forming the n-doped zones within the p-doped wafer substrate by an implantation method. During the etching process (e.g., with hydrofluoric acid), the porous layer (e.g., 30) is formed from and within the p-doped material of the substrate, and the underlying p-doped zones are removed through the porous layer. The n-doped zones are not readily etched away during the etching process. As such, as the p-doped zones are removed, the n-doped zones remain/are formed within the resulting cavity.

Dunn et al. disclose an integrated device assembly having multilayered corrosion-resistant capped copper bond pads, that may be used with a MEMS device. Dunn et al. disclose the integrated device assembly as including an integrated device (e.g., 210) that is connected to a lead frame (e.g., 252) by means of bond wires (e.g., 242). Dunn et al. disclose protecting the bond wires, leadframe, and integrated device with a silicone gel (e.g., 254). See the abstract, and column 6, line 58 through column 7, line 62 of Dunn et al.

Neither Benzel et al. nor Dunn et al. provide the requisite disclosure that would motivate a skilled artisan to combine or otherwise modify their disclosures in an attempt to somehow arrive at Applicants' presently claimed micro electro-mechanical device packaging system, or method of producing the micro electro-mechanical device packaging system. The micromechanical component of Benzel et al. necessarily includes a porous silicon zone or layer that is formed from the substrate material, and which defines the upper limit of the cavity that resides within the substrate. Dunn et al. provides no disclosure, teaching, or suggestion with regard to an integrated device that includes a porous silicon zone or layer that is formed from the substrate material, and which defines the upper limit of the cavity that resides within the substrate.

Even if Benzel et al. and Dunn et al. were combined, such combination would not result in the micro electro-mechanical device packaging system or method according to Applicants' present claims. Benzel et al. and Dunn et al., either alone or in combination do not disclose, teach or suggest a micro electro-mechanical device that includes a micro electro-mechanical device that is formed on a substrate layer, or which includes a protective structure that is positioned on a portion of the substrate layer, and which is a distinctive structure relative to the substrate layer.

Rejections based on "obviousness cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *KSR International Co. v. Teleflex Inc.*, 550 U.S. 398, 82 USPQ2d 1385, 1395 (2007). In addition, "a rationale to support a conclusion that a claim would have been obvious is that all the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change

in their respective functions, and the combination would have yielded nothing more than predictable results to one of ordinary skill in the art." *KSR International Co. v. Teleflex Inc.*, 550 U.S. 398, 82 USPQ2d 1385, 1395 (2007).

In light of the amendments herein and the preceding remarks, Applicants' claims are deemed to be unobvious and patentable over Benzel et al. in view of Dunn et al. Reconsideration and withdrawal of the present rejection is respectfully requested.

Claims 21-23 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Benzel et al. in view of Barth et al., and further in view of Dunn et al. and U.S. Patent No. 6,617,657 B1 (**Yao et al.**). This rejection is respectfully traverse in light of the following remarks.

Benzel et al. has been discussed previously herein and disclose a micromechanical component that includes: a substrate (e.g., a silicon wafer substrate 10 having p-doped and n-doped zones); a cavity (e.g., 50) that is formed within the substrate by etching; structures (e.g., permanent structures 70 and exposed structures 60) that are formed within the cavity by etching; and a porous silicon zone (e.g., 30) that is formed from the substrate material during etching, and which defines the upper limit of the cavity that resides within the substrate.

Benzel et al. describe forming the n-doped zones within the p-doped wafer substrate by an implantation method. During the etching process (e.g., with hydrofluoric acid), the porous layer (e.g., 30) is formed from and within the p-doped material of the substrate, and the underlying p-doped zones are removed through the porous layer. The n-doped zones are not readily etched away during the etching process. As such, as the p-doped zones are removed, the n-doped zones remain/are formed within the resulting cavity.

Barth et al. has been discussed previously herein, and disclose a layer arrangement and a process of forming the layer arrangement that involves sequentially applying or forming a layered structure with decomposable structures (e.g., 112) between upper (e.g., 124) and lower (e.g., 104) layers, and thermally decomposing the decomposable structures to from cavities (e.g., 128) residing between the upper and lower layers. The lower layer (e.g., 104) is formed over or on a silicon wafer (e.g., 100). Barth et al. provide no disclosure, teaching or suggestion with regard to encapsulating a microstructure, such as a MEMS device, in a decomposable structure (e.g., 112).

Dunn et al. has been discussed previously herein, and disclose an integrated device assembly having multilayered corrosion-resistant capped copper bond pads that may be used with a MEMS device. Dunn et al. disclose the integrated device assembly as including an integrated device (e.g., 210) that is connected to a lead frame (e.g., 252) by means of bond wires (e.g., 242). Dunn et al. disclose protecting the bond wires, leadframe, and integrated device with a silicone gel (e.g., 254).

Yao et al. disclose a process for manufacturing microelectromechanical devices, that involves two lithographic masking steps. The process of Yao et al. involves the formation of a composite structure (e.g., 200) by combining two separate organic adhesive layers (e.g., 112 and 104) together to form a single thermo-curable adhesive layer (e.g., 120) that is adhesively interposed between an upper silicon layer (e.g., 108) and a lower substrate layer (e.g., 102). An optional silicon dioxide layer (e.g., 110) may be interposed between the upper silicon layer and the single adhesive layer. Yao et al. disclose forming the microelectromechanical device by lithographic means over or on top of the substrate layer (e.g., 102). See the abstract, Figures 1 and 2, column 4, lines 23-39, and column 5, lines 25-35 of Yao et al.

As discussed previously herein, neither Benzel et al. nor Barth et al. provide the requisite disclosure that would motivate a skilled artisan to combine or otherwise modify their disclosures in an attempt to somehow arrive at Applicants' presently claimed micro electro-mechanical device packaging system, or method of producing the micro electro-mechanical device packaging system. In particular, Benzel et al disclose a micromechanical component that includes: a substrate; a cavity that is formed within the substrate by etching; structures that are formed within the cavity by etching; and a porous silicon zone that is formed from the substrate material during etching, and which defines the upper limit of the cavity that resides within the substrate. The layer arrangement of Barth et al. is formed on an underlying silicon substrate. Benzel et al. provide no disclosure, teaching or suggestion with regard to forming a microscopic structure or micromechanical component on a substrate. Barth et al, provide no disclosure, teaching, or suggestion with regard to forming a cavity and microscopic structures within the substrate, or a porous layer from the substrate material that defines the upper limit of an underlying cavity.

In addition, even if the disclosures of Benzel et al. and Barth et al. were combined, such a combination would result in an inoperable process, and as such would not result in the micro electro-mechanical device packaging system or method of Applicants' present claims. In particular, the process of Barth et al. necessarily involves forming a multilayer structure on top of a substrate. The process by which Benzel et al. forms their micromechanical component, necessarily involves removing substrate material through a porous layer of the substrate. As such, neither Benzel et al. nor Barth et al. provide disclosure regarding a reasonable way in which any of the layers of Barth et al., and in particular the decomposable structures (e.g., 112) of Barth et al., could somehow be deposited or otherwise introduced through the porous layer and into the cavity of Benzel et al. In addition, neither Benzel et al. nor Barth et al. provide disclosure that would encourage or motivate a skilled artisan to somehow attempt to deposit or introduce any of the layers of Barth et al., and in particular the decomposable structures (e.g., 112) of Barth et al., through the porous layer and into the cavity of Benzel et al.

None of Benzel et al., Barth et al., Dunn et al., or Yao et al. provide the requisite disclosure that would motivate a skilled artisan to combine or otherwise modify their disclosures in an attempt to somehow arrive at Applicants' presently claimed micro electro-mechanical device packaging system, or method of producing the micro electro-mechanical device packaging system.

The micromechanical component of Benzel et al. necessarily includes a porous silicon zone or layer that is formed from the substrate material, and which defines the upper limit of the cavity that resides within the substrate. Dunn et al. provides no disclosure, teaching or suggestion with regard to an integrated device that includes a porous silicon zone or layer that is formed from the substrate material, and which defines the upper limit of the cavity that resides within the substrate.

Benzel et al. disclose a micromechanical component that includes: a substrate; a cavity that is formed within the substrate, by etching; structures that are formed within the cavity, by etching; and a porous silicon zone that is formed from the substrate material, during etching, and which defines the upper limit of the cavity that resides within the substrate. Benzel

et al. provide no disclosure, teaching, or suggestion with regard to forming microstructures on top or over the substrate. Yao et al. disclose forming the microelectromechanical device by lithographic means over or on top of the substrate layer (e.g., 102). Yao et al. provide no disclosure, teaching or suggestion with regard to forming a microelectromechanical device within the substrate layer.

Barth et al. provide a layered structure that includes a decomposable structure (e.g., 112). Dunn et al. disclose protecting the bond wires, leadframe, and integrated device of their integrated device assembly with a silicone gel. Dunn et al. provide no disclosure, teaching or suggestion with regard to a layered structure that includes a decomposable structure.

Barth et al. provide a layered structure that includes a thermally decomposable structure (e.g., 112). Yao et al. provide no disclosure, teaching, or suggestion with regard to a process for manufacturing microelectromechanical devices, that involves thermally decomposing a thermally decomposable structure.

If proposed modifications render a reference inoperable for its intended purpose, then there is no suggestion or motivation to make the proposed modification, and accordingly the proposed modification would not be obvious. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984). Similarly, according to the MPEP, the claimed combination of references used to ground an obviousness rejection may not change the principle of operation of the primary reference or render the reference inoperable for its intended purpose. 2145(III); 2143.01.

Rejections based on "obviousness cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *KSR International Co. v. Teleflex Inc.*, 550 U.S. 398, 82 USPQ2d 1385, 1395 (2007). In addition, "a rationale to support a conclusion that a claim would have been obvious is that all the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded nothing more than predictable results to one of ordinary skill in the art." *KSR International Co. v. Teleflex Inc.*, 550 U.S. 398, 82 USPQ2d 1385, 1395 (2007).

In light of the preceding remarks, Applicants' claims are deemed to be unobvious and

patentable over Benzel et al. in view of Barth et al., and further in view of Dunn et al. and Yao et al. Reconsideration and withdrawal of the present rejection is respectfully requested.

Claim 38 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Benzel et al. in view of Barth et al., and further in view of U.S. Patent No. 6,953,985 B2 (**Lin et al.**). This rejection is respectfully traversed with regard to the following remarks.

On page 17 of the Office Action, Claim 29 is discussed under the above summarized rejection. As such, it appears that the above summarized rejection is drawn to both Claims 28 and 29. For purposes of expediency, and without making any admissions, Applicants will address the above recited rejection as if it were drawn to both Claims 28 and 29.

Benzel et al. has been discussed previously herein and disclose a micromechanical component that includes: a substrate (e.g., a silicon wafer substrate 10 having p-doped and n-doped zones); a cavity (e.g., 50) that is formed within the substrate by etching; structures (e.g., permanent structures 70 and exposed structures 60) that are formed within the cavity by etching; and a porous silicon zone (e.g., 30) that is formed from the substrate material during etching, and which defines the upper limit of the cavity that resides within the substrate.

Benzel et al. describe forming the n-doped zones within the p-doped wafer substrate by an implantation method. During the etching process (e.g., with hydrofluoric acid), the porous layer (e.g., 30) is formed from and within the p-doped material of the substrate, and the underlying p-doped zones are removed through the porous layer. The n-doped zones are not readily etched away during the etching process. As such, as the p-doped zones are removed, the n-doped zones remain/are formed within the resulting cavity.

Barth et al. has been discussed previously herein, and disclose a layer arrangement and a process of forming the layer arrangement that involves sequentially applying or forming a layered structure with decomposable structures (e.g., 112) between upper (e.g., 124) and lower (e.g., 104) layers, and thermally decomposing the decomposable structures to from cavities (e.g., 128) residing between the upper and lower layers. The lower layer (e.g., 104) is formed over or on a silicon wafer (e.g., 100).

Lin et al. disclose wafer level packaging of MEMS devices prior to wafer dicing. Lin et al. more particularly disclose a MEMS device array (e.g., 300) that includes a recess (e.g.,

205) into which is received a MEMS device (e.g., 310), and a dielectric lid (e.g., 340) that is attached to the MEMS device array (e.g., 300) by means of an interposed solder sealing ring (e.g., 320). See the abstract, column 1, lines 5-8, column 22, lines 36-62, and Figures 15 and 16 of Lin et al.

As discussed previously herein, neither Benzel et al. nor Barth et al. provide the requisite disclosure that would motivate a skilled artisan to combine or otherwise modify their disclosures in an attempt to somehow arrive at Applicants' presently claimed micro electro-mechanical device packaging system, or method of producing the micro electro-mechanical device packaging system. In particular, Benzel et al. disclose a micromechanical component that includes: a substrate; a cavity that is formed within the substrate by etching; structures that are formed within the cavity by etching; and a porous silicon zone that is formed from the substrate material during etching, and which defines the upper limit of the cavity that resides within the substrate. The layer arrangement of Barth et al. is formed on an underlying silicon substrate. Benzel et al. provide no disclosure, teaching, or suggestion with regard to forming a microscopic structure or micromechanical component on a substrate. Barth et al. provide no disclosure, teaching, or suggestion with regard to forming a cavity and microscopic structures within the substrate, or a porous layer from the substrate material that defines the upper limit of an underlying cavity.

In addition, even if the disclosures of Benzel et al. and Barth et al. were combined, such a combination would result in an inoperable process, and as such would not result in the micro electro-mechanical device packaging system or method of Applicants' present claims. In particular, the process of Barth et al. necessarily involves forming a multilayer structure on top of a substrate. The process by which Benzel et al. forms their micromechanical component, necessarily involves removing substrate material through a porous layer of the substrate. As such, neither Benzel et al. nor Barth et al. provide disclosure regarding a reasonable way in which any of the layers of Barth et al., and in particular the decomposable structures (e.g., 112) of Barth et al., could somehow be deposited or otherwise introduced through the porous layer and into the cavity of Benzel et al. In addition, neither Benzel et al. nor Barth et al. provide disclosure that would encourage or motivate a skilled artisan to somehow

attempt to deposit or introduce any of the layers of Barth et al., and in particular the decomposable structures (e.g., 112) of Barth et al., through the porous layer and into the cavity of Benzel et al.

Neither Benzel et al. nor Lin et al. provide the requisite disclosure that would motivate a skilled artisan to combine or otherwise modify their disclosures in an attempt to somehow arrive at Applicants' presently claimed micro electro-mechanical device packaging system, or method of producing the micro electro-mechanical device packaging system. The method of Benzel et al. necessarily involves the formation of a porous silicon zone that is formed from the substrate material during etching, and which defines the upper limit of the cavity that resides within the substrate. Lin et al. provide no disclosure, teaching, or suggestion with regard to the etch formation of a porous silicon zone that is formed from the substrate material during etching.

Neither Barth et al. nor Lin et al. provide the requisite disclosure that would motivate a skilled artisan to combine or otherwise modify their disclosures in an attempt to somehow arrive at Applicants' presently claimed micro electro-mechanical device packaging system, or method of producing the micro electro-mechanical device packaging system. The method of Barth et al. necessarily involves the thermal decomposition of a thermally decomposable structure between upper and lower layers. Lin et al. provide no disclosure, teaching, or suggestion with regard to the inclusion or use of a thermally decomposable structure in their MEMS packaging processes.

If proposed modifications render a reference inoperable for its intended purpose, then there is no suggestion or motivation to make the proposed modification, and accordingly the proposed modification would not be obvious. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984). Similarly, according to the MPEP, the claimed combination of references used to ground an obviousness rejection may not change the principle of operation of the primary reference or render the reference inoperable for its intended purpose. 2145(III); 2143.01.

Rejections based on "obviousness cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *KSR International Co. v. Teleflex Inc.*, 550 U.S. 398,

82 USPQ2d 1385, 1395 (2007). In addition, "a rationale to support a conclusion that a claim would have been obvious is that all the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded nothing more than predictable results to one of ordinary skill in the art." *KSR International Co. v. Teleflex Inc.*, 550 U.S. 398, 82 USPQ2d 1385, 1395 (2007).

In light of the preceding remarks, Applicants' claims are deemed to be unobvious and patentable over Benzel et al. in view of Barth et al., and further in view of Lin et_al. Reconsideration and withdrawal of the present rejection is respectfully requested.

Claims 47-50 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Benzel et al. in view of Barth et al., and further in view of Dunn et al. This rejection is respectfully traversed with regard to the following remarks.

Benzel et al. has been discussed previously herein and disclose a micromechanical component that includes: a substrate (e.g., a silicon wafer substrate 10 having p-doped and n-doped zones); a cavity (e.g., 50) that is formed within the substrate by etching; structures (e.g., permanent structures 70 and exposed structures 60) that are formed within the cavity by etching; and a porous silicon zone (e.g., 30) that is formed from the substrate material during etching, and which defines the upper limit of the cavity that resides within the substrate.

Benzel et al. describe forming the n-doped zones within the p-doped wafer substrate by an implantation method. During the etching process (e.g., with hydrofluoric acid), the porous layer (e.g., 30) is formed from and within the p-doped material of the substrate, and the underlying p-doped zones are removed through the porous layer. The n-doped zones are not readily etched away during the etching process. As such, as the p-doped zones are removed, the n-doped zones remain/are formed within the resulting cavity.

Barth et al. has been discussed previously herein, and disclose a layer arrangement and a process of forming the layer arrangement that involves sequentially applying or forming a layered structure with decomposable structures (e.g., 112) between upper (e.g., 124) and lower (e.g., 104) layers, and thermally decomposing the decomposable structures to from cavities (e.g., 128) residing between the upper and lower layers. The lower layer (e.g., 104) is

formed over or on a silicon wafer (e.g., 100).

Dunn et al. has been discussed previously herein, and disclose an integrated device assembly having multilayered corrosion-resistant capped copper bond pads, that may be used with a MEMS device. Dunn et al. disclose the integrated device assembly as including an integrated device (e.g., 210) that is connected to a lead frame (e.g., 252) by means of bond wires (e.g., 242). Dunn et al. disclose protecting the bond wires, leadframe, and integrated device with a silicone gel (e.g., 254).

On page 19 of the Office Action of 26 November 2008, Dunn et al. is described as disclosing the decomposition of a sacrificial layer being conducted within a range of 250 to 400°C. Applicants respectfully submit that Dunn et al. provides no disclosure, teaching or suggestion with regard to sacrificial layers or thermally decomposable sacrificial layers.

As discussed previously herein, neither Benzel et al. nor Barth et al. provide the requisite disclosure that would motivate a skilled artisan to combine or otherwise modify their disclosures in an attempt to somehow arrive at Applicants' presently claimed micro electro-mechanical device packaging system, or method of producing the micro electro-mechanical device packaging system. In particular, Benzel et al. disclose a micromechanical component that includes: a substrate; a cavity that is formed within the substrate by etching; structures that are formed within the cavity by etching; and a porous silicon zone that is formed from the substrate material during etching, and which defines the upper limit of the cavity that resides within the substrate. The layer arrangement of Barth et al. is formed on an underlying silicon substrate. Benzel et al. provide no disclosure, teaching, or suggestion with regard to forming a microscopic structure or micromechanical component on a substrate. Barth et al. provide no disclosure, teaching, or suggestion with regard to forming a cavity and microscopic structures within the substrate, or a porous layer from the substrate material that defines the upper limit of an underlying cavity.

In addition, even if the disclosures of Benzel et al. and Barth et al. were combined, such a combination would result in an inoperable process, and as such would not result in the micro electro-mechanical device packaging system or method of Applicants' present claims. In particular, the process of Barth et al. necessarily involves forming a multilayer

structure on top of a substrate. The process by which Benzel et al. forms their micromechanical component, necessarily involves removing substrate material through a porous layer of the substrate. As such, neither Benzel et al. nor Barth et al. provide disclosure regarding a reasonable way in which any of the layers of Barth et al., and in particular the decomposable structures (e.g., 112) of Barth et al., could somehow be deposited or otherwise introduced through the porous layer and into the cavity of Benzel et al. In addition, neither Benzel et al. nor Barth et al. provide disclosure that would encourage or motivate a skilled artisan to somehow attempt to deposit or introduce any of the layers of Barth et al., and in particular the decomposable structures (e.g., 112) of Barth et al., through the porous layer and into the cavity of Benzel et al.

The micromechanical component of Benzel et al. necessarily includes a porous silicon zone or layer that is formed from the substrate material, and which defines the upper limit of the cavity that resides within the substrate. Dunn et al. provides no disclosure, teaching, or suggestion with regard to an integrated device that includes a porous silicon zone or layer that is formed from the substrate material, and which defines the upper limit of the cavity that resides within the substrate.

Barth et al. provide a layered structure that includes a decomposable structure (e.g., 112). Dunn et al. disclose protecting the bond wires, leadframe, and integrated device of their integrated device assembly with a silicone gel. Dunn et al. provide no disclosure, teaching, or suggestion with regard to a layered structure that includes a decomposable structure.

If proposed modifications render a reference inoperable for its intended purpose, then there is no suggestion or motivation to make the proposed modification, and accordingly the proposed modification would not be obvious. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984). Similarly, according to the MPEP, the claimed combination of references used to ground an obviousness rejection may not change the principle of operation of the primary reference or render the reference inoperable for its intended purpose. 2145(III); 2143.01.

Rejections based on "obviousness cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *KSR International Co. v. Teleflex Inc.*, 550 U.S. 398,

82 USPQ2d 1385, 1395 (2007). In addition, "a rationale to support a conclusion that a claim would have been obvious is that all the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded nothing more than predictable results to one of ordinary skill in the art." *KSR International Co. v. Teleflex Inc.*, 550 U.S. 398, 82 USPQ2d 1385, 1395 (2007).

In light of the preceding remarks, Applicants' claims are deemed to be unobvious and patentable over Benzel et al. in view of Barth et al., and further in view of Dunn_et al. Reconsideration and withdrawal of the present rejection is respectfully requested.

Claims 43-45 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Benzel et al., Barth et al., and Cheung in view of Dunn et al. This rejection is respectfully traversed in light of the following remarks.

Benzel et al. has been discussed previously herein and disclose a micromechanical component that includes: a substrate (e.g., a silicon wafer substrate 10 having p-doped and n-doped zones); a cavity (e.g., 50) that is formed within the substrate by etching; structures (e.g., permanent structures 70 and exposed structures 60) that are formed within the cavity by etching; and a porous silicon zone (e.g., 30) that is formed from the substrate material during etching and which defines the upper limit of the cavity that resides within the substrate.

Benzel et al. describe forming the n-doped zones within the p-doped wafer substrate by an implantation method. During the etching process (e.g., with hydrofluoric acid), the porous layer (e.g., 30) is formed from and within the p-doped material of the substrate, and the underlying p-doped zones are removed through the porous layer. The n-doped zones are not readily etched away during the etching process. As such, as the p-doped zones are removed, the n-doped zones remain/are formed within the resulting cavity.

Barth et al. has been discussed previously herein, and disclose a layer arrangement and a process of forming the layer arrangement that involves sequentially applying or forming a layered structure with decomposable structures (e.g., 112) between upper (e.g., 124) and lower (e.g., 104) layers, and thermally decomposing the decomposable structures to from cavities (e.g., 128) residing between the upper and lower layers. The lower layer (e.g., 104) is

formed over or on a silicon wafer (e.g., 100).

Cheung has been discussed previously herein, and discloses a method of hermetically packaging a microscopic structure including a microelectromechanical system (MEMS) device. The method disclosed by Cheung necessarily involves: depositing a capping layer of sacrificial material (e.g., 34) over a microscopic structure (e.g., 24) residing on a substrate (e.g., 26); depositing a support layer (e.g., 38) over the capping layer; forming at least one hole (e.g., 40) through the support layer; removing the capping layer through the holes by etching; depositing a sealing material (e.g., 46) over the support layer; and locally heating the sealing material so as to melt the sealing material and hermetically seal the holes (e.g., 40).

Dunn et al. has been discussed previously herein, and disclose an integrated device assembly having multilayered corrosion-resistant capped copper bond pads, that may be used with a MEMS device. Dunn et al. disclose the integrated device assembly as including an integrated device (e.g., 210) that is connected to a lead frame (e.g., 252) by means of bond wires (e.g., 242). Dunn et al. disclose protecting the bond wires, leadframe, and integrated device with a silicone gel (e.g., 254).

As discussed previously herein, neither Benzel et al. nor Barth et al. provide the requisite disclosure that would motivate a skilled artisan to combine or otherwise modify their disclosures in an attempt to somehow arrive at Applicants' presently claimed micro electro-mechanical device packaging system, or method of producing the micro electro-mechanical device packaging system. In particular, Benzel et al. disclose a micromechanical component that includes: a substrate; a cavity that is formed within the substrate by etching; structures that are formed within the cavity by etching; and a porous silicon zone that is formed from the substrate material during etching, and which defines the upper limit of the cavity that resides within the substrate. The layer arrangement of Barth et al. is formed on an underlying silicon substrate. Benzel et al. provide no disclosure, teaching, or suggestion with regard to forming a microscopic structure or micromechanical component on a substrate. Barth et al. provide no disclosure, teaching or suggestion with regard to forming a cavity and microscopic structures within the substrate, or a porous layer from the substrate material that defines the upper limit of an underlying cavity.

In addition, even if the disclosures of Benzel et al. and Barth et al. were combined, such a combination would result in an inoperable process, and as such would not result in the micro electro-mechanical device packaging system or method of Applicants' present claims. In particular, the process of Barth et al. necessarily involves forming a multilayer structure on top of a substrate. The process by which Benzel et al. forms their micromechanical component, necessarily involves removing substrate material through a porous layer of the substrate. As such, neither Benzel et al. nor Barth et al. provide disclosure regarding a reasonable way in which any of the layers of Barth et al., and in particular the decomposable structures (e.g., 112) of Barth et al., could somehow be deposited or otherwise introduced through the porous layer and into the cavity of Benzel et al. In addition, neither Benzel et al. nor Barth et al. provide disclosure that would encourage or motivate a skilled artisan to somehow attempt to deposit or introduce any of the layers of Barth et al., and in particular the decomposable structures (e.g., 112) of Barth et al., through the porous layer and into the cavity of Benzel et al.

Neither Benzel et al. nor Cheung provide the requisite disclosure that would motivate a skilled artisan to combine or otherwise modify their disclosures in an attempt to somehow arrive at Applicants' presently claimed micro electro-mechanical device packaging system. In particular, Benzel et al. disclose a micromechanical component that includes: a substrate; a cavity that is formed within the substrate by etching; structures that are formed within the cavity by etching; and a porous silicon zone that is formed from the substrate material during etching, and which defines the upper limit of the cavity that resides within the substrate. The hermitically packaged MEMS device of Cheung includes a microscopic structure (e.g., 24) that resides on a substrate. Benzel et al. provide no disclosure, teaching, or suggestion with regard to forming a microscopic structure on a substrate. Cheung provides no disclosure, teaching, or suggestion with regard to forming a cavity and microscopic structures within the substrate, or a porous layer from the substrate material that defines the upper limit of an underlying cavity.

In addition, even if the disclosures of Benzel et al. and Cheung were combined, such a combination would result in an inoperable process, and as such would not result in the

micro electro-mechanical device packaging system or method of Applicants' present claims. In particular, the process of Cheung necessarily involves depositing a capping layer of sacrificial material (e.g., 34) over a microscopic structure (e.g., 24) residing on a substrate (e.g., 26). The process by which Benzel et al. forms their micromechanical component, necessarily involves removing substrate material through a porous layer of the substrate. As such, neither Benzel et al. nor Cheung provide disclosure regarding a reasonable way in which the capping layer of sacrificial material of Cheung could somehow be deposited or otherwise introduced through the porous layer and into the cavity of Benzel et al. In addition, neither Benzel et al. nor Cheung provide disclosure that would encourage or motivate a skilled artisan to somehow attempt to deposit or introduce the capping layer of sacrificial material of Cheung through the porous layer and into the cavity of Benzel et al.

Neither Benzel et al. nor Dunn et al. provide the requisite disclosure that would motivate a skilled artisan to combine or otherwise modify their disclosures in an attempt to somehow arrive at Applicants' presently claimed micro electro-mechanical device packaging system or method. The micromechanical component of Benzel et al. necessarily includes a porous silicon zone or layer that is formed from the substrate material, and which defines the upper limit of the cavity that resides within the substrate. Dunn et al. provides no disclosure, teaching, or suggestion with regard to an integrated device that includes a porous silicon zone or layer that is formed from the substrate material, and which defines the upper limit of the cavity that resides within the substrate.

Neither Barth et al. nor Cheung provide the requisite disclosure that would motivate a skilled artisan to combine or otherwise modify their disclosures in an attempt to somehow arrive at Applicants' presently claimed micro electro-mechanical device packaging system or method. Barth et al. provide no disclosure, teaching or suggestion with regard to applying a thermally decomposable structure over a microscopic structure, or removing the thermally decomposable structure by etching, or whether such would be feasible. Cheung provides no disclosure, teaching or suggestion with regard to removing their etchable capping layer by means of thermal decomposition, or whether such would be feasible.

Neither Barth et al. nor Dunn et al. provide the requisite disclosure that would

motivate a skilled artisan to combine or otherwise modify their disclosures in an attempt to somehow arrive at Applicants' presently claimed micro electro-mechanical device packaging system or method. Barth et al. provide a layered structure that includes a decomposable structure (e.g., 112). Dunn et al. disclose protecting the bond wires, leadframe, and integrated device of their integrated device assembly with a silicone gel. Dunn et al. provide no disclosure, teaching, or suggestion with regard to a layered structure that includes a decomposable structure.

Neither Cheung nor Dunn et al. provide the requisite disclosure that would motivate a skilled artisan to combine or otherwise modify their disclosures in an attempt to somehow arrive at Applicants' presently claimed micro electro-mechanical device packaging system or method. The method disclosed by Cheung necessarily involves: depositing a capping layer of sacrificial material (e.g., 34) over a microscopic structure (e.g., 24) residing on a substrate (e.g., 26); depositing a support layer (e.g., 38) over the capping layer; forming at least one hole (e.g., 40) through the support layer; removing the capping layer through the holes by etching; depositing a sealing material (e.g., 46) over the support layer; and locally heating the sealing material so as to melt the sealing material and hermetically seal the holes (e.g., 40). Dunn et al. provide no disclosure, teaching, or suggestion with regard to forming one or more holes is a previously deposited support layer, and then removing an underlying capping layer through the holes by etching. In addition, Dunn et al. provide no disclosure, teaching, or suggestion with regard to locally heating a previously deposited sealing material, so as to hermetically seal the holes previously formed in the support layer.

If proposed modifications render a reference inoperable for its intended purpose, then there is no suggestion or motivation to make the proposed modification, and accordingly the proposed modification would not be obvious. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984). Similarly, according to the MPEP, the claimed combination of references used to ground an obviousness rejection may not change the principle of operation of the primary reference or render the reference inoperable for its intended purpose. 2145(III); 2143.01.

Rejections based on "obviousness cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *KSR International Co. v. Teleflex Inc.*, 550 U.S. 398,

82 USPQ2d 1385, 1395 (2007). In addition, "a rationale to support a conclusion that a claim would have been obvious is that all the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded nothing more than predictable results to one of ordinary skill in the art." *KSR International Co. v. Teleflex Inc.*, 550 U.S. 398, 82 USPQ2d 1385, 1395 (2007).

In light of the preceding remarks, Applicants' claims are deemed to be unobvious and patentable over Benzel et al., Barth et al., and Cheung in view of Dunn et al. Reconsideration and withdrawal of the present rejection is respectfully requested.

CONCLUSION

In light of the amendments herein and the preceding remarks, Applicants' presently pending claims are deemed to meet all the requirements of 35 U.S.C. §112, and to define an invention that is unanticipated, unobvious and hence, patentable. Reconsideration of the rejections and allowance of all of the presently pending claims is respectfully requested.

Respectfully submitted,

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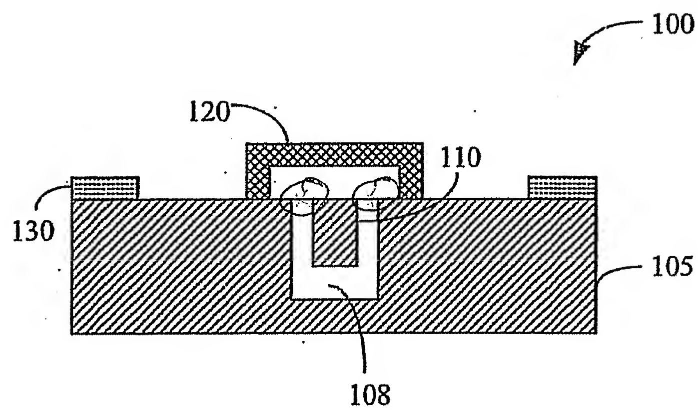

FIG. 1